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Repair Instructions – General, Test Equipment, Opening the Device

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1 Service Strategy

Test/Repair Site	Test Document/Program	Repair/Replacement
Inspection in the field	Test Certificate	Minor repairs. Sensors Hoses Fuses Battery (optional)
Repair in the field	Test Certificate Service Mode	Replacement of subassemblies. Calibration, if necessary.
Repair at the subsidiary workshop	Test Certificate Service Mode	Replacement of subassemblies. Calibration, if necessary.
Repair at the Lübeck workshop	Test Certificate Service Mode Design documentation	Repair on component level

Before opening the device, read the following warning:

CAUTION

Electrostatic discharge can damage electronic components. Use an ESD protection mat and a wrist strap when handling electronic modules.

When replacing batteries, sensors etc. read the following instructions:

IMPORTANT

The O_2 sensors and the batteries are special waste. Dispose of the O_2 sensors and the batteries according to your local waste disposal regulations.

The connector pin assignment tables cover only the most important connections.

2   Test Equipment and Tools

Other test equipment is listed in the Repair Instructions under "Software Versions and Download" and "Loading the Software via BD 32". Test equipment for inspection purposes are listed under "Test Certificate".

2.1   Electronics

RS232 cable (not transposed)	79 01 808
RS232 adapter (transposed)	79 01 888
Test connector Com 2-6 (RS232 short-circuit connector)	79 01 885
Extender board (1 x 96-pin)	79 01 061

IMPORTANT: Extender boards, 79 01 061, change status < 04, have only 64 pins. These extender boards are not suitable for this Evita 4 version.

Extender board (2 x 96-pin)	79 01 631

IMPORTANT: Extender boards, 79 01 631, change status < 02, have only 2 x 64 pins. These extender boards are not suitable for this Evita 4 version.

Multimeter (4 3/4 digits)	79 10 429
Measuring leads (at least 6 off), for example:	
• Measuring lead, red, 1 m, 2 off	79 01 022
• Measuring lead, black, 1 m, 2 off	79 01 023
• Measuring lead, red, 0.25 m, 2 off	79 01 679
• Measuring lead, black, 0.25 m, 2 off	79 01 680
Measuring probes (at least 6 off), for example:	
• Measuring probe, red, Kleps 30, 4 off	79 01 026
• Measuring probe, black, Kleps 30, 4 off	79 01 027
Measuring probes (at least 6 off), for example:	
• Measuring probe, red, PP 130	79 01 024
• Measuring probe, black, PP 130	79 01 025

VDE portable test set, complete, required to test the electrical safety of 230/240 V equipment (equivalent leakage current and protective earth conductor resistance). The tester can be switched to 110 V.	79 00 234
Soldering set	79 01 267
Unsoldering set	16 21 572
Extractor for PLCC	79 00 664
Test connector, ILV interface	79 10 455
Test cable, analog interface	79 10 456
Uni test board with cable harness	79 00 620

2.2 CO_2 Measurement

There are different test gases and calibration gases available. The ideal test gas is CO_2 in nitrogen:

• Minican: 5% CO_2, 95% N	68 50 435

For higher test and calibration tolerances you can also use the following test gas:

• Minican: 5% CO_2, 65% N_2O, 30% O_2	82 90 271
Valve for Minicans	82 90 272
Floppy disk with test program "host4210.exe" for desktop PC or laptop. The laptop must be equipped with a graphics board and a 386 CPU or better.	79 01 831
Testboard unit with cable set	79 00 620

You will need the following tools to test the complete CO_2 measurement (in the workshop) outside of the Evita:

Stabilized dc supply (5 V/2 A). You can also use the Evita.

CO_2 cable set	79 01 955

The CO_2 cable set includes the following items:

• Cable, RS232, CO_2 (RS232 connection)	79 01 956
• Ribbon cable, CO_2 (connection between the two printed circuit boards of the CO_2 measurement)	79 01 957
• Cable, power supply, CO_2	79 01 958

2.3   Pneumatics

Pressure gauge, −30 to 120 mbar	79 01 958
Stepped socket	2M 06 924
Hose 4 x 1.5 Si nf (500 mm)	11 90 520
Bellows	84 09 742
T-piece (cone)	84 00 904
Corrugated hose	84 10 709
Test pressure regulator	79 01 482
Secretion sight glass	2M 07 582
Pressure gauge, 0 to 5 bar	79 01 516
Endotracheal tube	84 10 078
Hose 7 x 2.5 Si nf (1200 mm)	11 98 343
Connector, 5.5 mm This connector is included in the catheter connector kit	84 03 684
Hose 2 x 1 Si nf (100 mm)	11 80 614
Hose 6 x 2.5 Si nf (200 mm)	11 97 851
Hose 4 x 1.5 Si nf (100 mm)	11 94 925
Corrugated hose	84 02 041
Flowmeter block, 0.01 to 14 L/min	79 01 161

2.4   General Tools and Supplies

Various screwdrivers and hexagon socket wrenches

Varnish stick, blue Munsell	79 01 261
Varnish stick, bright-orange Munsell	79 01 262
Varnish stick, gray-white RAL 9002	79 00 380
Adhesive, UHU Plus	11 95 255
Screw locking agent, red, RC 3000	84 11 687
Screw locking agent, low, Loctite 221	79 01 966
Silicone rubber, Wacker Elastosil E50	12 11 382
Box of cleaning cloths	79 018 87

3   Assemblies (Overview)

The Evita 4 consists of three major assemblies:

- electronics

- control unit

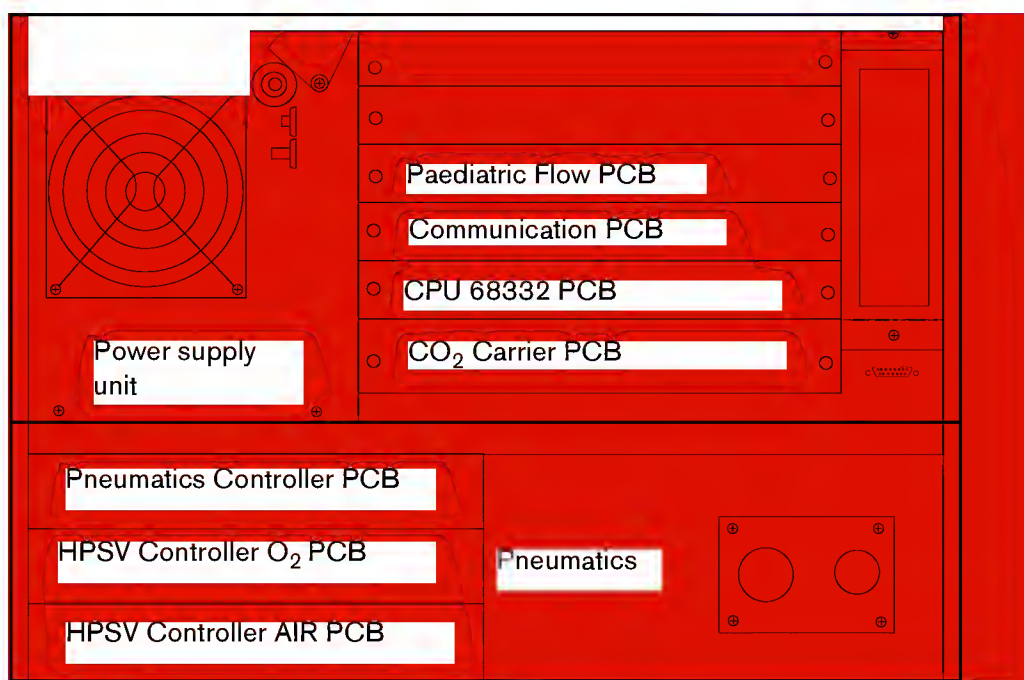- pneumatics.

3.1   Electronics/Pneumatics Subassemblies

Paediatric Flow PCB

Communication PCB

CPU 68332 PCB

CO_2 Carrier PCB

Power supply
unit

Pneumatics Controller PCB

HPSV Controller O_2 PCB

Pneumatics

HPSV Controller AIR PCB

Fig.   1: Electronics/pneumatics subassemblies

See the repair procedure for a detailed description of the subassemblies and how to dismount them. The Power Supply PCB, the Processor Board PCB and the optional SpO_2 Module are located on the CO_2 Carrier PCB.
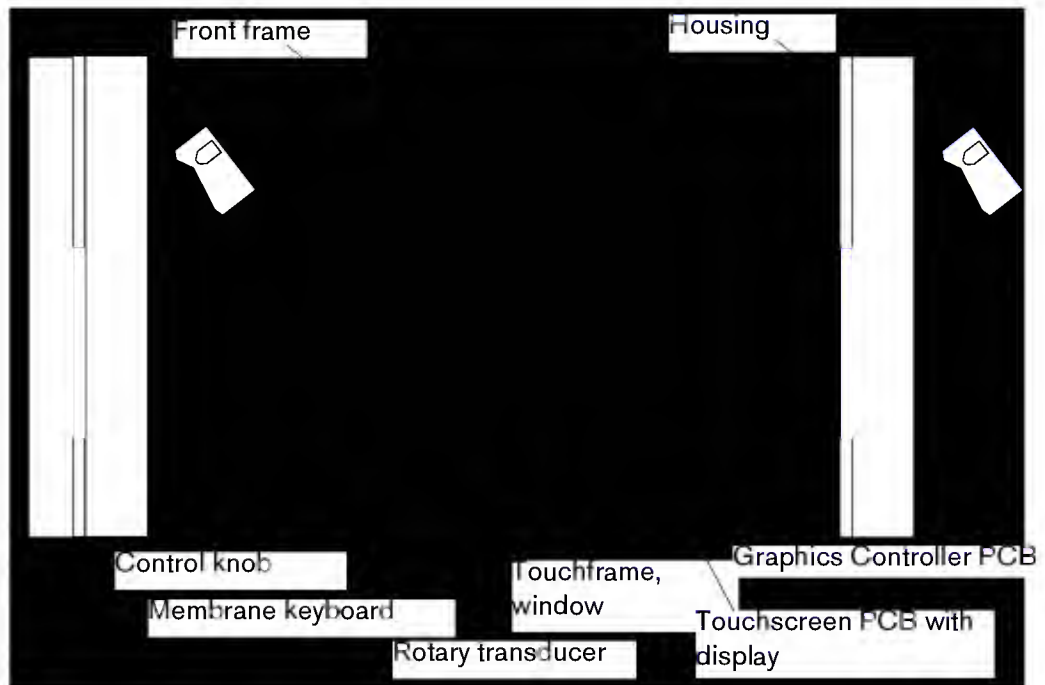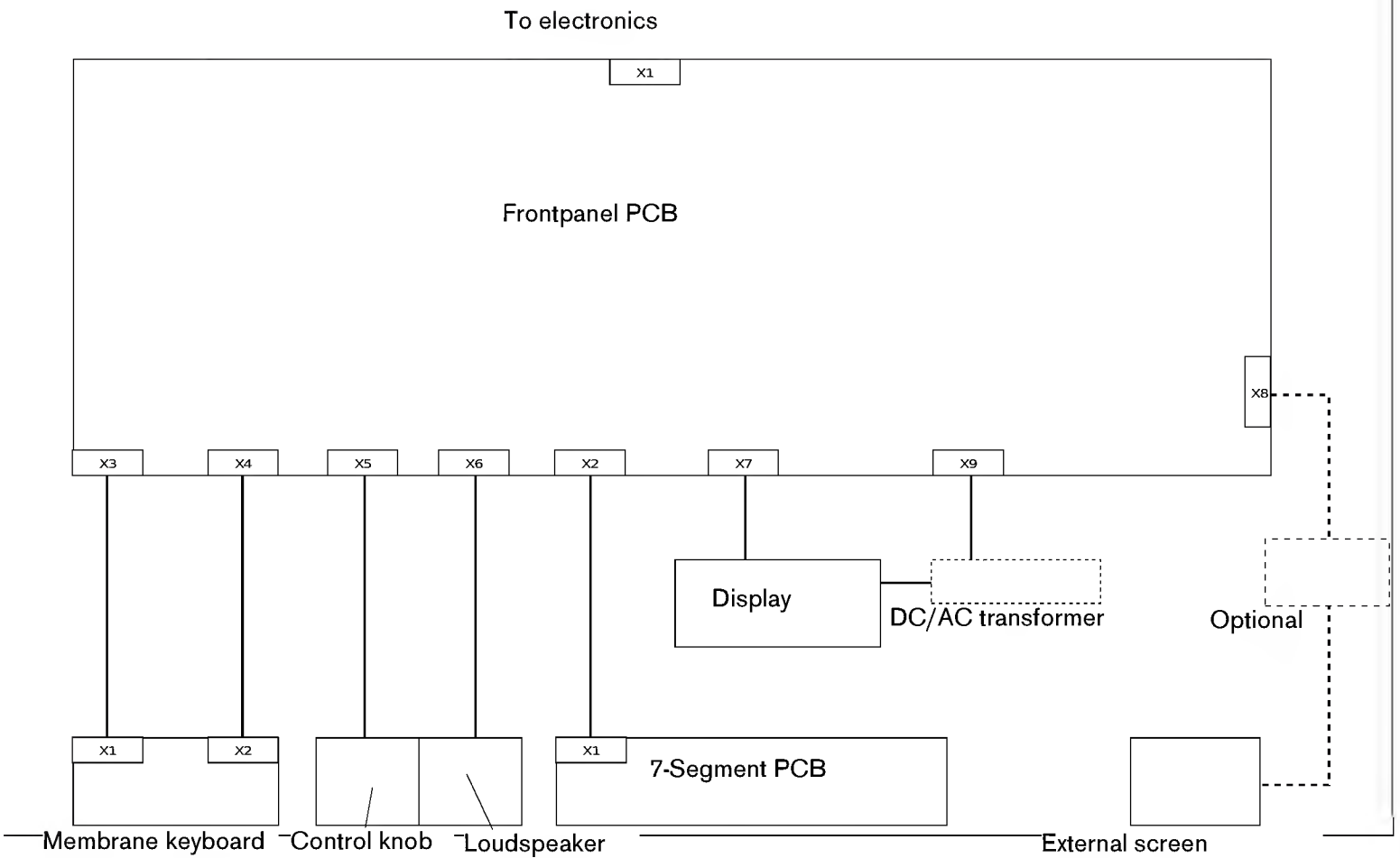
3.2 Control Unit Subassemblies Evita 4

Fig. 2: Control unit subassemblies

4   Front Panel Connector Layout Evita 2 dura

Dräger Medizintechnik

To electronics

X1

Frontpanel PCB

X8

X3   X4   X5   X6   X2   X7   X9

Display

DC/AC transformer

Optional

X1   X2   X1   7-Segment PCB

Membrane keyboard   Control knob   Loudspeaker   External screen

Fig.   3: Connector layout

Dräger

5 Opening the Evita 4/ Evita 2 dura

Open the Evita as described below:

- Remove the screw **A** from the left side panel of the Evita.
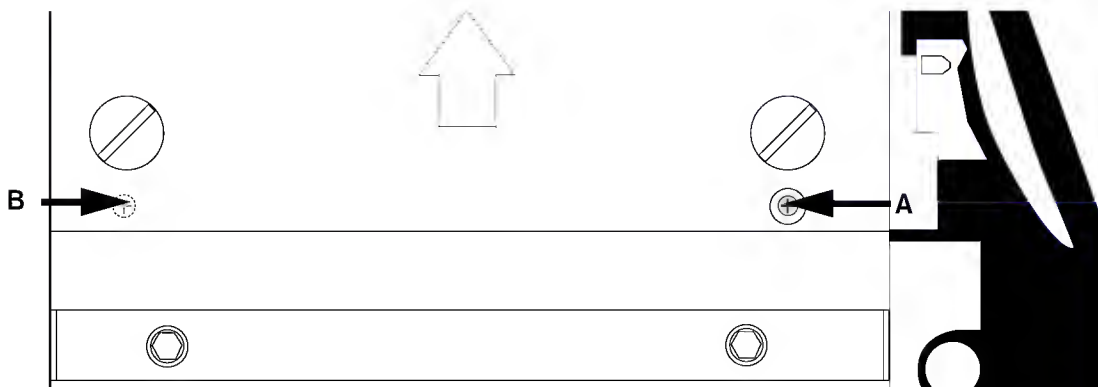- Loosen the screw **B** from the inside of the left side panel of the Evita.

Fig. 4: Left side view of the Evita 4

- Evita 4: Remove the control unit and suspend it from the left rail.
- Evita 4: Secure the control unit using the retaining clamp. The retaining clamp is located on the back of the control unit.
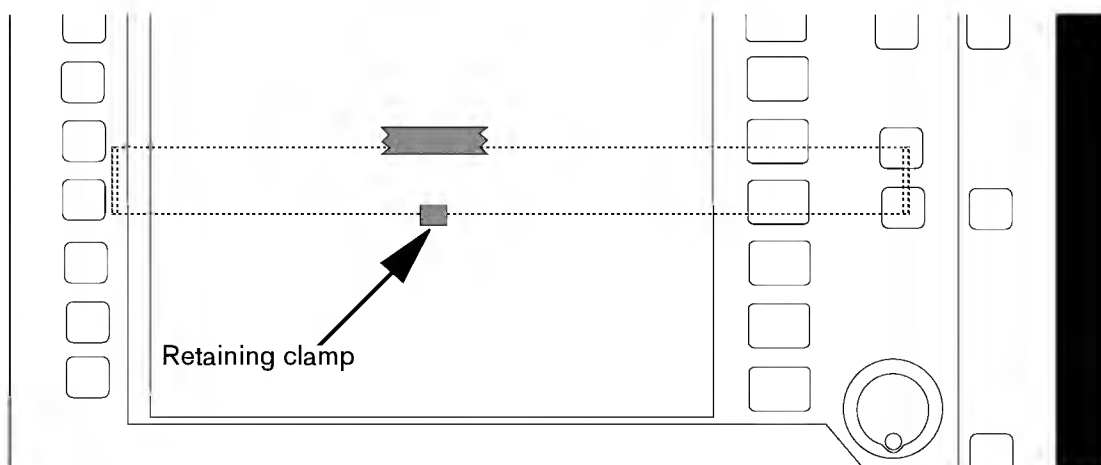
Retaining clamp

Fig. 5: Left side view of the Evita 4 with control unit.

- Fold up the electronics assembly until the mount locks into place. The mount is located at the bottom of the Evita.

6 Opening the Control Unit Evita 4

Open the control unit as follows:

- Remove the control unit and place it on the ESD protection mat.

- Remove the Sub D connector from the Evita 4.

- Loosen the four Phillips screws **A** at the rear of the control unit.

- Remove the front frame (along with the four spacers (in newer versions)).
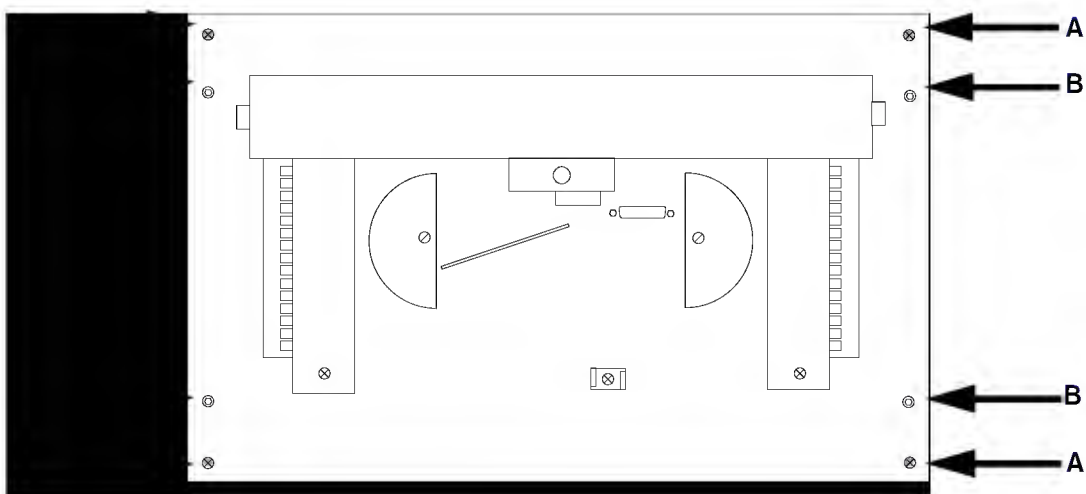
- Remove the four screws **B**.

Fig. 6: Rear view of the control unit
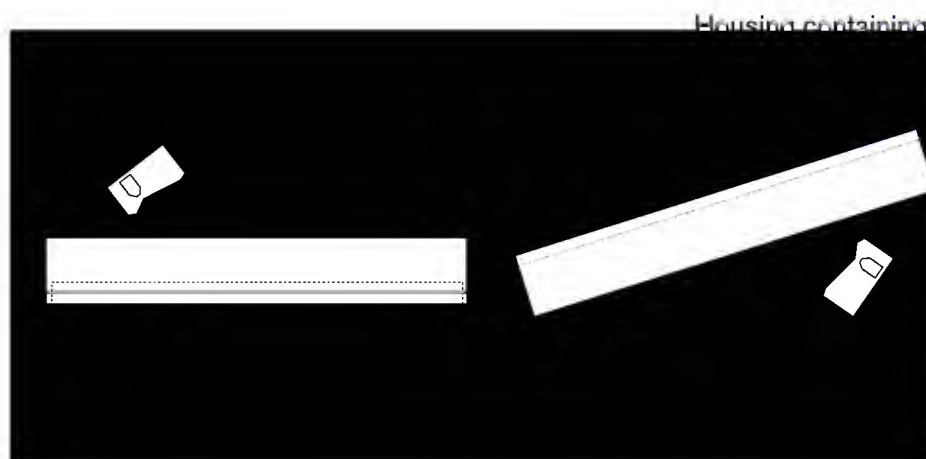
- Open up the control unit.

Fig. 7: Opening up the control unit

7 Opening the Front Panel Evita 2 dura

- Switch off the Evita 2 dura.

- Loosen the 2 threaded bolts **A** at the front panel bottom cover.

- Remove the front frame **B**.

- Remove the 2 screws **C** on the left-hand and right-hand side of the front panel.
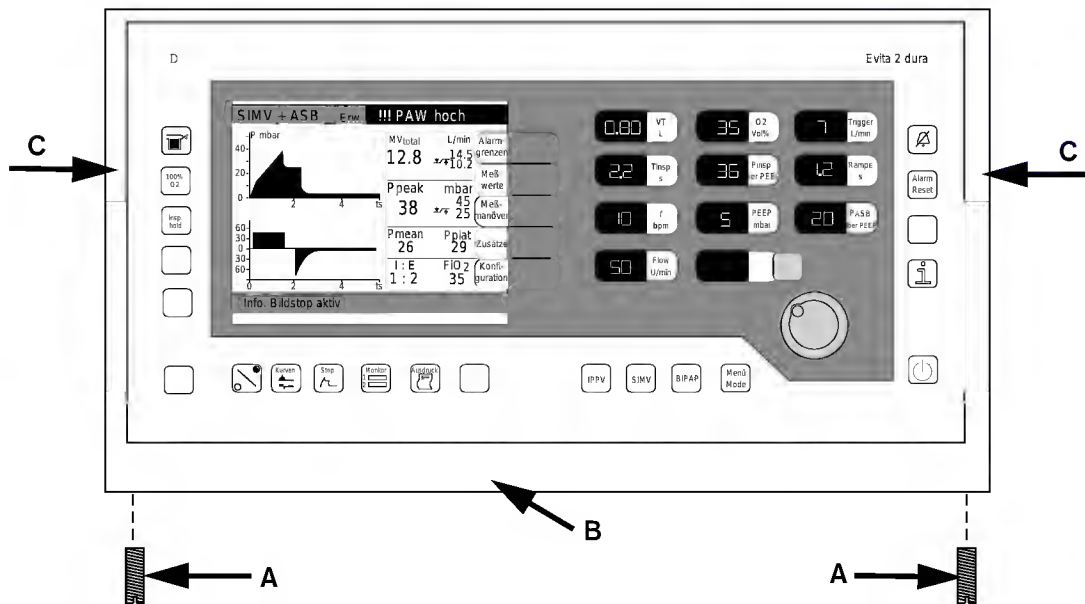
Fig. 8: Opening the front panel

- Fold down the front panel.

- You now have access to the Frontpanel PCB and to the plug-in connectors. To gain access to the display and to the 7-Segment PCB, remove the Frontpanel PCB.

- Re-assemble the front panel using the reverse method of that used for disassembly.

Carry out the safety check and the functional check according to Test Certificate.

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